

Application No. 09/396,266
Docket No. 1998U007A.US
Reply to Office Action Dated May 15, 2003

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-3 (Cancelled).

4. (Previously cancelled).

5. (Cancelled).

6. (Previously cancelled).

7-11 (Cancelled).

12-13 (Previously cancelled).

14-20 (Cancelled).

21. (Previously cancelled).

22. (Cancelled)

23. (Previously cancelled).

24-28 (Cancelled).

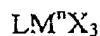
29-30 (Previously cancelled).

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31-32 (Cancelled).

33. (New) A process for polymerizing olefins comprising contacting olefin(s) with a catalyst system comprising an activator and a catalyst precursor, wherein

- (a) the activator is a neutral or ionic ionizing salt comprising a cation selected from the group consisting of triphenylcarbenium, dimethylanilinium, and trialkylammonium, and an anion selected from the group consisting of borate and aluminate; and
- (b) the catalyst precursor is represented by:



wherein M is a Group 4 metal;
L is an unsubstituted or substituted indenyl, fluorenyl ligand or substituted cycloalkadienyl ligand except for pentamethylcyclopentadienyl;
X is selected from the group consisting of hydrogen, and unsubstituted and substituted versions of: aryl, alkyl, alkenyl, alkylaryl, and arylalkyl radicals having from 1-20 carbon atoms; and
n is 4.

34. (New) The process of claim 33 wherein L is a substituted cycloalkadienyl excepting pentamethylcyclopentadienyl.

35. (New) The process of claim 33 wherein L is an unsubstituted or substituted indenyl or fluorenyl ligand.

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36. (New) The process of claim 33 wherein the activator is a salt comprising a cation selected from the group consistent of triphenylcarbenium, dimethylanilinium, and trialkylammonium, and an anion that is a borate.

37. (New) The process of claim 33 wherein the catalyst system is selected from the group consisting essentially of (MeCp)Zr(CH₂Ph)₃/ triphenylcarbenium tetrakis(pentafluorophenyl)borate, (1,3-Me₂Cp)Zr(CH₂Ph)₃/ triphenylcarbenium tetrakis(pentafluorophenyl)borate, (Fluorenyl)Zr(CH₂Ph)₃/ triphenylcarbenium tetrakis(pentafluorophenyl)borate, 2-(p-tolylindenyl)Zr(CH₂Ph)₃/ triphenylcarbenium tetrakis(pentafluorophenyl)borate, (1-trimethylsilylindenyl)Zr(CH₂Ph)₃(η^6 (PhCH₂B(C₆F₅)₃))/ triphenylcarbenium tetrakis(pentafluorophenyl)borate or (1,3-Me₂Cp)Zr(CH₂Ph)₃/ trihexylammonium tetrakis(pentafluorophenyl)borate.

38. (New) A catalyst system comprising an activator and a catalyst precursor, wherein

(a) the activator is a neutral or ionic salt comprising a cation selected from the group consisting of triphenylcarbenium, dimethylanilinium, and trialkylammonium, and an anion selected from the group consisting of borate and aluminate; and

(b) the catalyst precursor is represented by:

LM^nX_3

wherein M is a Group 4 metal;
L is an unsubstituted or substituted indenyl, fluorenyl ligand or substituted cycloalkadienyl ligand except for pentamethylcyclopentadienyl;

X is selected from the group consisting of hydrogen, and unsubstituted and substituted versions of: aryl, alkyl,

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alkenyl, alkylaryl, and arylalkyl radicals having from 1-20
carbon atoms; and

n is 4.

39. (New) The catalyst system of claim 38 wherein L is a substituted cycloalkadienyl excepting pentamethylcyclopentadienyl.

40. (New) The catalyst of claim 38 wherein L is an unsubstituted or substituted indenyl or fluorenyl ligand.

41. (New) The process of claim 38 wherein the activator is a salt comprising a cation selected from the group consisting of triphenylcarbenium, dimethylanilinium, and trialkylammonium, and an anion that is a borate.

42. (New) The catalyst system of claim 38 selected from the group consisting essentially of $(MeCp)Zr(CH_2Ph)_3$ / triphenylcarbenium tetrakis(pentafluorophenyl)borate, $(1,3-Me_2Cp)Zr(CH_2Ph)_3$ / triphenylcarbenium tetrakis(pentafluorophenyl)borate, $(Fluorenyl)Zr(CH_2Ph)_3$ / triphenylcarbenium tetrakis(pentafluorophenyl)borate, $2-(p-tolylindenyl)Zr(CH_2Ph)_3$ / triphenylcarbenium tetrakis(pentafluorophenyl)borate, $(1-trimethylsilylindenyl)Zr(CH_2Ph)_3(\eta^6(PhCH_2B(C_6F_5)_3))$ / triphenylcarbenium tetrakis(pentafluorophenyl)borate or $(1,3-Me_2Cp)Zr(CH_2Ph)_3$ / trihexylammonium tetrakis(pentafluorophenyl)borate.